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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/647,259	08/26/2003	Yasunori Suzuki	241973US90	2085

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OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER

BAYARD, EMMANUEL

ART UNIT	PAPER NUMBER
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2611

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	04/12/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Notice of this Office communication was sent electronically on the above-indicated "Notification Date" and has a shortened statutory period for reply of 3 MONTHS from 04/12/2007.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/647,259

Applicant(s)

SUZUKI ET AL.

Examiner

Emmanuel Bayard

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 January 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

This is in response to amendment filed on 1/17/07 in which claims 1 and 3-6 are pending. The applicant's amendments have been fully considered but they are moot based on the new ground of rejection therefore this case is made final.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pinckley et al U.S. Patent No 6,983,026 B2 in view of Hongo et al U.S. 7,142,615 B2.

As per claim 1, Pinckley et al teaches a transmitter comprising: an input-side digital multi-port directional coupler configured to divide and combine digital transmission signals of N channels by digital processing and configured to output N-channel signals to N transmission channels, respectively (see figs.2, 8 element 203, and col.4, lines 20-67 and col.8, lines 15-25); N predistorters inserted in said N transmission channels, respectively, configured to provide compensating predistortions to the N-channel signals outputted from input-side digital multi-port directional coupler (see figs. 2, 8 elements 206, 806 and col.5, lines 60-67 and col.6, lines 10-15 and col.7, lines 40-67 and col.17, lines 56-67); N transmitting parts inserted in said N transmission channels, respectively, configured to convert (see figs. 2, 8 element 209 and col.6, lines

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50-67) output signals from said N predistorters to N high-frequency signals of said N channels each of said N transmitting parts including a power amplifier for amplifying power of the high-frequency signal; an output-side multi-port power combiner configured to divide and combine N said high-frequency signals to output N high-frequency transmission signals (see figs. 2, 8 element 211 and col.8, lines 23-26).

However Pinckley does not teach N receiving parts configured to extract, from said N high-frequency signals, distortion components produced by the power amplifiers and configured to generate, based on said distortion components, compensating signals which control said N predistorters, wherein based on said compensating signals, said N predistorters generate compensating predistortions and impart said compensating predistortions to said N-channel signals, respectively, to cancel the distortion components at said power amplifiers.

Hongo et al teaches N demodulators are the same as the claimed (N receiving parts) configured (see figs.6 and 9 element 15 or 32 and col.22, lines 6-20) to extract (see col.23, lines 53-65), from said N high-frequency signals, distortion components produced by the power amplifiers (see fig.9 element 4 and col.6, lines 11-13) and configured to generate, based on said distortion components, compensating signals which control (see fig.9 element 33) said N predistorters (see fig.9 element PD1-PDN), wherein based on said compensating signals, said N predistorters generate compensating predistortions and impart said compensating predistortions to said N-channel signals, respectively, to cancel the distortion components at said power amplifiers (see col.12, lines 1-15).

It would have been obvious to one of ordinary skill in the art to implement the teaching of Hongo into Pinckley as to acquire a control amount for distortion compensation appropriate for the total power level based on the distortion compensation characteristic of each signal divided by frequency band as taught by Hongo (see col.12, lines 1-5).

As per claim 3, Pinckley et al teaches, wherein said predistorters of N channels are digital predistorters of N channels for imparting said compensating distortions to said signals of N channel by digital processing, and which further comprises: digital-to-analog converters (see figs. 2, 8 element 233) of N channels for converting the outputs from said predistorters of N channels to analog signals of N channels and for applying said analog signals of N channels to said transmitting parts of N channels, respectively; and digital-to-analog converters of N channels for converting said compensating signals from said receiving parts of N channels to digital compensating signals and for applying said digital compensating signals to said digital predistorters of N channels (see figs. 2, 8 and col.6, lines 59-67).

As per claim 4, Pinckley et al teaches, wherein said predistorters of N channels are analog predistorters, and which further comprises digital-to-analog converters of N channels for converting said signals of N channels output from said input side digital multi-port directional coupler to analog signals for application to said digital predistorters of N channels, said receiving parts of N channels providing said compensating signals to said digital predistorters (see figs. 2, 8 and col.6, lines 59-67).

As per claim 5, Pinckley et al teaches wherein each of said transmitting parts of

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N channels includes: an up-converting part (see figs. 2, 8 element 237) for the corresponding one of said signals of N channels to a high-frequency signal of the transmission frequency band; and a power amplifier for amplifying the power of said high-frequency signal and for applying said power-amplified high-frequency signal to said output side multi-port directional coupler (see figs. 2, 8 element 231 or 241 and col.7, lines 5-34).

As per claim 6, Hongo et al teaches wherein each of said receiving parts of N channels includes: detecting part for detecting the corresponding one of said high-frequency signals of N channels (see col.23, lines 25-30); a band-pass filter for extracting a distortion component by said power amplifier from said detected output) (see col.23, lines 53-65); and a control part for (see fig.9 element 33) generating said compensating signal based on said distortion component. Furthermore implementing such teaching into Pinckley would have been obvious to one skilled in the art as to acquire a control amount for distortion compensation appropriate for the total power level based on the distortion compensation characteristic of each signal divided by frequency band as taught by Hongo (see col.12, lines 1-5).

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cova U.S. Patent No 6,141,390 teaches predistortion in a linear transmitter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel Bayard whose telephone number is 571 272 3016. The examiner can normally be reached on Monday-Friday (7:Am-4:30PM)
Alternate Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on 571 272 2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emmanuel Bayard
Primary Examiner
Art Unit 2611

4/4/07


EMMANUEL BAYARD
PRIMARY EXAMINER